U.S. Department of Transportation
Federal Highway Administration

Centered on Service

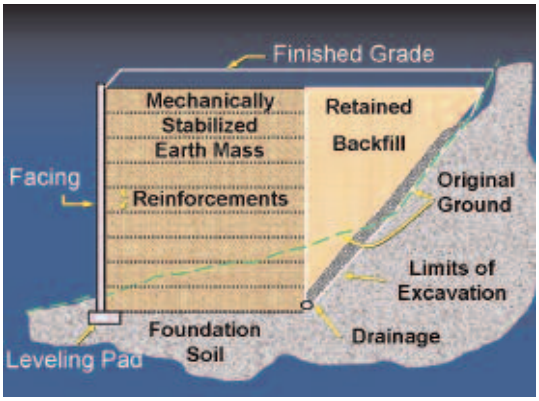
VOLUME 3, ISSUE 1 FEBRUARY 2007

INSIDE

Centered on Service *is dedicated to sharing success stories and updates on FHWA Resource Center projects and ongoing news about services provided by the Technical Service Teams to the FHWA Division Offices, Headquarters Offices, and State partners.*

30 Years of MSE Walls on America's Interstates

Mechanically stabilized earth (MSE) is a construction technique for building retaining walls and embankments using alternating layers of compacted soil and reinforcing elements. The reinforcement elements, which can be either steel or synthetic, interact with the soil by friction and confinement and provide tensile capacity. The combination of soil and reinforcement behaves as a gravity mass for holding back soil lateral earth pressures. The MSE technique has been used for approximately 34 of the 50 years that the interstate highway system has been in existence. One of the earliest MSE walls in the United States was constructed in 1972 on California State Highway 39, northeast of Los Angeles. Since then, MSE walls have increasingly grown in popularity and are now accepted by most highway departments as a standard retaining wall for fill or embankment support applications.



Typical MSE wall cross-sectional view

Problem

Retaining walls were viewed as rigid structural elements constructed from traditional structural materials such as concrete and steel. The MSE concept was a radical departure from the status quo, which had an exemplary track record. An argument for change based purely on cost savings could not persuade

See **MSE** *on Page 2*

MSE *from page 1*

decisionmakers to take on the potential risk that these "new and unproven" structures presented. For example, there were many technical questions about MSE walls, particularly those having to do with soil-reinforcement interaction, face deformation, and durability of the reinforcement elements.

The design methods were for the most part specific to proprietary MSE wall systems and were often difficult to verify. The primary difference between the various design methods was in the internal stability calculations. Specifically, the various approaches differed in how the vertical stress was calculated and how the stiffness of the reinforcement elements affected the calculations. The stiffness issue became increasingly significant as more reinforcement types were developed and were competing against each other in proprietary wall systems.

Solution

Reinforcement of Earth Slopes and Embankments (NCHRP Report 290) provided a comprehensive literature review of various MSE systems of the day. The report reviewed earth reinforcement systems, including their reinforcement mechanisms, behavior, applications, designs, and durability. It was the first step in bringing MSE wall design out of the commercial realm and into the domain of practicing engineers and researchers.

The guidelines for internal stability of MSE walls have seen several design methods and significant changes through research studies and practical experience. The FHWA research document *Behavior of Reinforced Soil* was a study on MSE walls and slope systems that evaluated bar mats, strips, geosynthetic sheets, soil nails, and anchored systems. This research was the basis for *Behavior of Reinforced Soil Structures Volume I Design and Construction Guidelines* (FHWA-RD-89-043), a report aimed at developing a procedure that could be used for any reinforcement type. The "Simplified Coherent Gravity Method" was developed from this work in an effort to merge and make clear the preferred design approach. The American Association of State Highway and Transportation Officials--through the T-15 Technical Committee on Substructures and Walls--calibrated the new procedure based on full-scale MSE wall case history data and adopted it. The NCHRP Report 290 and the FHWA-RD-89-043 report referenced all of the MSE-related research that had been performed up to 1990. Since then, significant research completed in this area is as follows:

- FHWA-SA-96-071, ***Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines***
- WSDOT Research Report WA-RD 513.1, 96 pp. ***Development of the Simplified Method for Internal Stability Design of Mechanically Stabilized Earth (MSE) Walls***

On-going research activities include the MSE Wall Pooled-Fund Study (and its extension) to address design of MSE walls using marginal backfill soils, and the NCHRP Project No. 24-22, which also is addressing the use of marginal backfill soils.

Benefits

Although gravity or cantilever cast-in-place (CIP) concrete walls have worked well and are economical for some situations, in most cases they cannot compete with MSE walls. The construction of MSE walls became easier, faster, and more economical particularly in fill situations, which in some cases could be onsite backfill material. In addition, MSE walls can be built quickly from prefabricated materials such as pre-cast concrete panels or modular blocks. The Transportation Research Record No. 144 report entitled "Segmental Concrete MSE Walls, Geogrid Reinforcements, and Soil Nailing" provided case histories of the use and the construction performance of MSE walls constructed

See **MSE** *on Page 3*

Seattle-Tacoma International Airport (Sea-Tac) third runway embankment wall in Seattle, WA.

MSE *from page 2*

using segmental concrete units. It is estimated that the constructed cost of MSE walls is generally 30 to 50 percent less expensive than the CIP concrete walls depending primarily on the wall height. Based on this the current estimated yearly cost savings for the use of MSE over CIP walls is $180 million per year.

Application

There are now more than 60,000 MSE walls on America's highways--and they are commonly constructed to heights that exceed 35 feet. Of particular note, the highest transportation-related wall in the United States, supporting the Sea-Tac Airport's third runway, reaches a truly impressive height of 140 feet. It is estimated that today's MSE wall "rate of use" for transportation applications is in excess of nine million square feet per year.

MSE walls are also much more flexible and therefore can tolerate significantly more total and differential settlement compared to CIP concrete walls. Consequently, they offer viability to some design schemes that could not otherwise be obtained. The introduction of MSE walls 30 years ago is still changing the way we now design highways. There is no doubt that the benefits of MSE wall use will be realized for at least another 30 years and that more changes are ahead.

We would like to acknowledge the French engineer Henry Vidal as the pioneer of metallic reinforced MSE and Dick Bell as the pioneer of geosynthetic MSE and the many research and development efforts that have been put forth by academia, industry, and public agencies.

For more information on MSE walls contact:

Daniel Alzamora
Geotechnical Engineer
FHWA Resource Center
(720) 963-3214
daniel.alzamora@fhwa.dot.gov

Rich Barrows
Geotechnical Engineer
FHWA Resource Center
(360) 619-7704
rich.barrows@fhwa.dot.gov

TECHNOLOGY DEPLOYMENT

GDOT Moves ITS Program Forward

Georgia Department of Transportation (GDOT) engineers attended the ITS America and the ITS World Congress Conferences, the leading conferences in the ITS field. The introduction to the various technologies showcased at these events was invaluable to the GDOT district ITS program staff as it moves forward with innovative closed-circuit television installation, traffic signal control systems, and enhancing the State's incident management.

These events explored the latest technologies for intelligent transportation systems and featured speakers from all over the world who are prominent in the field. The turnout was very good, and it provided opportunities for practitioners in the transportation field to network with each other as well as with equipment vendors and policymakers.

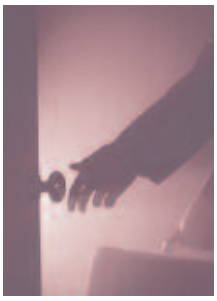
The GDOT participants left these events with informative materials and many new contacts. Some of the ideas covered have already been implemented by GDOT and others are in the works.

These topics are especially relevant to the needs and priorities of the FHWA. The FHWA provides oversight on most ITS projects and provides vision for DOTs to implement these programs. ITS projects help to reduce congestion and improve safety by delivering real-time traffic information to the public. ITS also provides an information network utilized by 911 centers, local jurisdictions, police, fire etc. Conferences such as these allow States to increase their expertise, bring good ideas used in other States to "home team" practitioners and reduce the time and cost of implementing new technologies by learning from the the experiences of others.

For more information on technology deployment activities and events contact:

Mark Sandifer
Technology Deployment Specialist
FHWA Resource Center
(708) 283-3528
mark.sandifer@fhwa.dot.gov

Opening the Door for Technology Deployment



What is a person's tipping point when it comes to making the decision to use a new technology or methodology? What goes into an argument that will convince the public that a project is worthy of funding? It is not always easy to "sell" a new idea, but by employing some innovative techniques and classic theories of persuasion, it is possible to communicate with potential users in a way that will open the door to technology deployment.

Everett M. Rogers, author of *The Diffusion of Innovation*, concluded that innovations that are perceived by individuals as having the characteristics of relative advantage, simplicity, compatibility, trialability, and observability will be adopted more quickly. Whether the individuals are members of the public, local officials, transportation organizations, or others, those charged with technology deployment increase their chances for success if they communicate how well the new technology fits these criteria.

Think of the potential users of an invention, idea, product, or methodology as though they were behind a locked door. You are on the other side of the door with the innovation that has the potential to help them achieve success. There are five locks on the door. The locks represent the potential user's possible objections to the innovation. Overcoming the objections is like unlocking the door for those customers. The keys that will open the locks are the innovation's qualities of relative advantage, simplicity, compatibility, trialability, and observability.

The characteristics represented by the keys can make your customer's decision to start using a new technology much easier. Keys can be used to introduce a new technology to your customers, and these keys can form the basis of a convincing argument for its adoption and implementation.

When interacting with a customer who has previously made a decision not to move forward with a new technology, communication is vital. You need to understand their objections so that you can address them specifically, to use the appropriate keys in your communication exchanges with them.

ASSEMBLING THE SET OF KEYS

"Finding your keys" is a relatively simple process. For each innovation, the characteristics that match each of the five key areas should be determined and properly described. It may not be possible to address all five keys through every technology, but identifying as many as possible increases the likelihood of an individual making the decision to adopt it.

Relative advantage Put simply, this means that there is a **clear benefit to the new approach over the old one**. It can be anything from time or cost savings to effectiveness. It might be a more aesthetically pleasing result or greater harmony with the environment. It might be a decrease in fatalities. It might make driving easier for older adults. In the case of a new road deicer, for example, a relative advantage might be that the new product works in a broader range of temperatures or is lighter and therefore reduces the fuel consumption of the trucks that carry it.

Simplicity Is the new technology **easy to understand**? Easy to explain? If a technology is difficult to learn to use or complicated to understand, it will be much more difficult to persuade people to adopt it. For example, if a new road deicer required each snow equipment operator to take a class before they could use it, it would not be considered easy to use. If the public does not understand how a new deicer works they might not accept its use in their community as readily.

Compatibility If the new product is **compatible with current ways of doing things** and the equipment that is on hand, it will be much easier for people to begin using it. For example, if a new road deicer can

See **OPENING DOORS** on Page 5

Photo Courtesy of Aggregate Industries, US

A product demonstration, where a ready mix truck was driven onto a 4x4 Concrete pavement placed just 4 hours earlier.

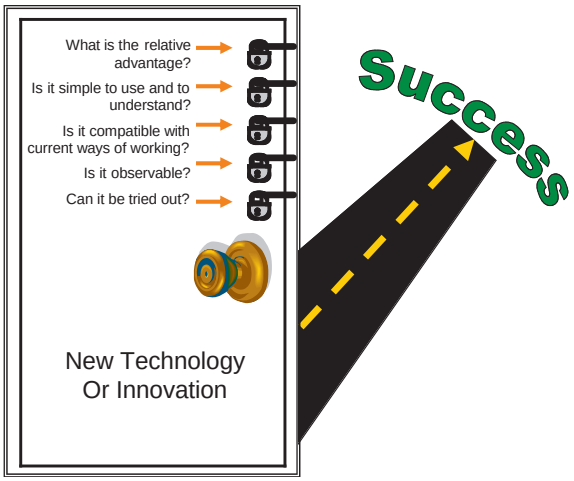
OPENING DOORS *from Page 4*

be applied using the same trucks, drivers and equipment as current deicers, compatibility is one of its characteristics. If the new deicer would require learning an entirely new application method or would require the purchase of new equipment, it lacks compatibility. Since few ideas are 100 percent compatible, highlight the areas in which compatibility exists.

Observability When it is possible for a prospective user to **observe a current user** having success with an innovation, they will be more likely to accept the new technology themselves. If a current user's situation is very similar to the prospective user's situation the better able he will be to imagine what his experience with the new product will be. To create observability for customers, seek out sources of best practices and success stories. Ask current users to talk to your customers. If possible, arrange for customers to visit current users to experience the technology up close. **Product demonstration showcases** are wonderful opportunities to let people observe new technologies. FHWA publications, including *Centered on Service* and *Public Roads*, are rich sources of both best practices and customer experiences.

Trialability Trialability means that **customers can test the new technology without a large time or financial commitment.** Can a customer practice using a new computer model at an industry trade show? Is it possible to arrange for customers to borrow or lease equipment for a short time? Can a product be demonstrated or examined at a trade show? For the example of an imaginary new deicer, the product might be applied to a specific stretch of road and performance observed over one snow season.

CREATING THE MARKETING MESSAGE
Analyzing an innovation using this framework produces an outline for an argument that can be used in communications with customers. The keys can be used as talking points for meetings, incorporated into the text of a brochure, highlighted in a press release, incorporated into a course or workshop, or used when talking with customers at a trade show booth. Anyone charged with technology deployment will be in a better position to help customers make informed decisions when they have already thought through the possible objections or concerns.



JUST A BEGINNING
The method described here is just one of a variety of ways that effective customer communications can be developed. The FHWA Resource Center can help you develop a product demonstration showcase and marketing messages that enable more effective communication with your customers.

For more information on developing a product demonstration showcase, contact:

Mark Sandifer
Technology Deployment Specialist
FHWA Resource Center
(708) 283-3528
mark.sandifer@fhwa.dot.gov

To discuss technology deployment marketing strategies, contact:

Judith Johnson
Marketing Specialist
FHWA Resource Center
(404) 562-3682
judith.johnson@fhwa.dot.gov

Marie C. Roybal
Marketing Specialist
FHWA Resource Center
(720) 963-3241
marie.roybal@fhwa.dot.gov

Deborah Vocke
Marketing Specialist
FHWA Resource Center
(410) 962-3744
deborah.vocke@fhwa.dot.gov

SPECIAL FEATURE

VDOT Research Library Tops All State DOTs in Catalogued Holdings

Collection has more than 26,000 records in international online register

The research library of the Virginia Department of Transportation (VDOT) is now the nation's largest library at a State department of transportation in terms of holdings catalogued in the Online Computer Library Center, or the OCLC, the standard by which this ranking is measured.

This exceptional collection is available for use by any FHWA or State DOT personnel. Those interested in borrowing UVA resource holdings must submit requests thru their State DOT library or any public library that uses the OCLC.

The VDOT's research library is housed at the Virginia Transportation Research Council (VTRC)--the VDOT's research arm. This library was created in 1954--at the Research Council--by the former State highway department, making it one of the oldest State DOT-affiliated transportation libraries in the nation. The electronic conversion of approximately 26,000 cataloged records, representing more than 36,000 volumes in this online cooperative, began only three years ago. The VDOT then joined the OCLC in mid-2003 to expand its access (primarily to all its employees) throughout the Commonwealth.

Through VDOT's partnership with the University of Virginia (UVA) in the Research Council and VTRC's location on the UVA grounds, UVA faculty and students also have direct access to the documents in the research library. Because the university's library system is an OCLC member, its users can view the holdings in the VDOT research library as well. Other top State DOT libraries in terms of OCLC holdings are in Wisconsin, Ohio, Massachusetts, and Washington.

The Online Computer Library Center is comprised of 55,000 libraries in 110 countries and was created to increase access to materials, defray costs and make interlibrary lending easier. This network of libraries and other research centers allows VDOT staff to access not only its own library, but billions of resources worldwide, while sharing VDOT's own titles, research papers and other documents with the other OCLC members, including State and Federal transportation professionals, research agencies and universities.

The research library's staff continues to add new holdings daily to this catalog as it reduces the number of documents in its backlog from its pre-electronic days. Circulation is up 200 percent in the last 12 months because more documents are easier to access.

See **LIBRARY** *on Page 7*

VDOT RESEARCH LIBRARY FACTS:

- **Created in 1954 at the Research Council by the former State highway department, making it one of the oldest State DOT-affiliated transportation libraries in the nation**
- **The Transportation Library Connectivity Pooled-Fund Study (TLCAT), provides a sub-database of the Online Computer Library Center's main "WorldCAT" database, and allows VDOT employees, UVA faculty and students, and other OCLC members to search other leading U.S. transportation libraries**
- **Full library services available to all VDOT employees and UVA faculty and students**
- **Library staff:**

  Ken Winter
  Director of Library and Information Services
  (434) 293-1959

  Patricia DeSalvo
  Associate Librarian
  (434) 293-1965

  Gale Smith
  Assistant Librarian
  (434) 293-1959

LIBRARY *from Page 6*

"Our library's small staff did an outstanding job in three short years in bringing VDOT's research collection up to date, from zero to 26,000, with this electronic conversion," said Gary R. Allen, VDOT chief of technology, research and innovation.

"Making this information instantly available to all VDOT employees, as well as our online access now to many other libraries, is already saving the department time and money as it strives to meet the challenges laid out in the agency's new business plan."

The Virginia Transportation Research Council is a partnership of VDOT and the UVA and is located on the grounds of the UVA campus in Charlottesville.

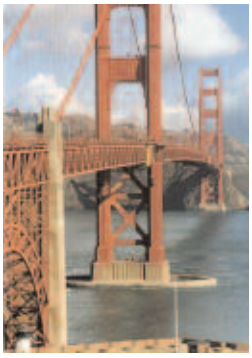
For more information about the Research Council contact:

Ann M. Overton
Public Affairs Manager
Virginia Transportation Research Council
Phone: (434) 293-1912
Ann.Overton@VDOT.Virginia.gov
or visit their website at: at www.vtrc.net

TRAINING

Conference Examines 50 Years of Highway Hydraulics

The 2006 National Hydraulic Engineering Conference was held from August 29 through September 1, 2006 at the Wyndham Emerald Plaza in San Diego, CA.



The conference was co-sponsored by the California Transportation Department, the FHWA National Hydraulics Team, and the FHWA California Division Office. The conference steering committee was headed by Cynthia Nurmi, Resource Center Hydraulics Engineer. The conference **"50 Years of Highway Hydraulics – Where We've Been and Where We're Going"** celebrated the 50th anniversary of the Interstate Highway System and recognized the efforts of many Federal and State engineers over the past several decades to advance the field of Hydraulic Engineering.

The keynote address for the conference was delivered by Mr. Stan Davis, who joined the Bureau of Public Roads in 1959. Mr. Davis worked in various Division and Regional Offices from 1961 to 1980 and served as Chief of the Hydraulics Branch from 1980 to 1988. He currently serves as a hydraulics consultant to the Maryland State Highway Administration.

Mr. Davis' presentation reflected on the various contributions of many engineers to the FHWA Hydraulics program and raised questions as to how transportation departments might best contribute to the advancement of this profession during the next 50 years.

Over the past 50 years, hydraulic engineers have contributed greatly to the construction of the National Highway System by developing and further refining methods of providing highway drainage and minimizing the dynamic and erosive impacts of streams and rivers on highway infrastructure. Though the main issues in highway hydraulics seem to have remained the same over the past 50 years (i.e., scour, stream stability, erosion, and drainage), the surface transportation community has witnessed developments and fine tuning of methods and technologies to overcome these challenges. In the future, Federal, State, and local partners will need to continue to address these issues within the backdrop of limited funding, aging infrastructure, and stricter attention to environmentally sensitive design.

See **HYDRAULICS** *on Page 8*

HYDRAULICS *from Page 7*

Specific conference session topics included:

- *Major Flooding*
- *Environmentally Sensitive Channel Protection*
- *Hydraulic Modeling Developments and Applications*
- *Fish Passage*
- *Stream Stability*
- *Water Quality Research and Implementation*
- *Scour Countermeasures and Instrumentation*
- *Energy Dissipators and Erosion Control*
- *Bottomless Culverts*
- *Plans of Action for Scour Critical Bridges and Pipes*
- *Materials*
- *Asset Management*
- *Rehabilitation*

In addition to sharing project planning, design, and implementation experiences in these various focus areas, conference presenters also discussed the latest hydraulic research and technology initiatives. More information about the conference and electronic copies of the various session presentations can be found at the FHWA Hydraulics website: ***www.fhwa.dot.gov/engineering/hydraulics/conferences/hyd2006.cfm***

To learn more about the 2006 National Hydraulic Conference or plans for the next national hydraulic conference, contact:

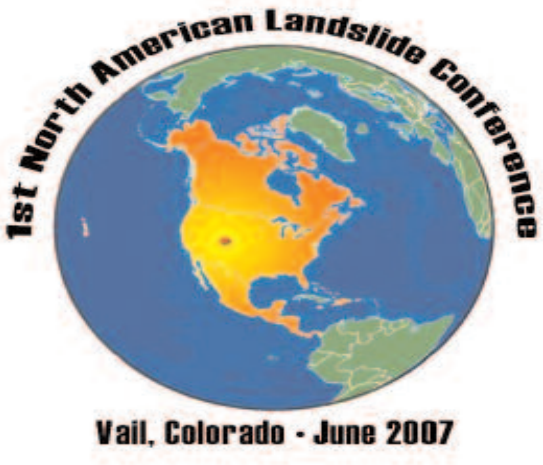
Cynthia Nurmi
Hydraulics Engineer
FHWA Resource Center
(404) 562-3908
cynthia.nurmi@fhwa.dot.gov

1st North American Landslide Conference coming June 2007

The 1st-ever North American Landside Conference will be held in Vail, Colorado, June 3-10, 2007.

Objectives

The conference is designed to provide a stimulating forum for geoscientists, engineers, planners, economists, program managers, and other decision makers concerned with landslide hazards and their impact on North American society.



There are four days of technical sessions (Monday, Tuesday, Thursday, and Friday) and one day (Wednesday) of technical excursions, included in the registration fee.

The conference addresses the entire range of technical and social-economic policy issues surrounding assessment and management of all types of slope instability.

Conference Themes

The conference has two major themes – "Monitoring & Management of Slopes & Landslides" and "Evaluation & Control of Landslides." These themes include a variety of topics that emphasize latest developments and practical experiences across the entire spectrum of landslide management and mitigation issues – including scientific, technological, engineering design, and socio-economic aspects. The technical excursions on Wednesday provide field examples supporting many of these topics.

Co-sponsors of this landmark event include: the American Rock Mechanics Association, the Association of Environmental & Engineering Geologists, the GEO Institute, the Transportation Research Board, and the Canadian Geotechnical Society. The Federal Highway Administration Resource Center's Geotechnical and Hydraulics Technical Service Team is helping to coordinate the event.

See ***LANDSLIDE*** *on Page 9*

LANDSLIDE *from Page 8*

The following is a list of planned program sessions in each of the two major theme areas:

A. MONITORING & MANAGEMENT OF SLOPES & LANDSLIDES

1. Landslides and Society: an Overview of Landslide Processes
2. Advances in Landslide Mapping and Modeling
3. Advances in Parameterization, Instrumentation, and Monitoring
4. Appraisal of Instability and Risk
5. Loss Reduction Strategies
6. Snow Avalanches - Hazards and Mitigation

B. EVALUATION & CONTROL OF LANDSLIDES

7. Characterization and Assessment of Earth and Rock Slides
8. Landslide Triggering Mechanisms
9. Stabilization of Landslide Masses
10. Remedial Works and Hazard Mitigation
11. Landslides in Permafrost
12. Debris Flows and Debris Avalanches
13. Rockfall Evaluation and Control

If you are interested in registering for the event on-line, visit the website at: *www.mines.edu/academic/geology/landslide-vail2007/*

For additional information on the upcoming conference contact:
Barry D. Siel, P.E.
Senior Geotechnical Engineer
FHWA Resource Center
(720) 963-3208
barry.siel@fhwa.dot.gov

CENTERED ON RESULTS

FHWA Resource Center Welcomes New Team Members

CIVIL RIGHTS TST

Sandra Talbert-Jackson
Equal Opportunity/
Contract Compliance Specialist
(410) 962-0116
sandy.talbertjackson@fhwa.dot.gov

Sandra Talbert-Jackson has joined the Resource Center Civil Rights Technical Service Team as an Equal Opportunity/Contract Compliance Specialist with 18 years of experience. She brings to the team expertise in the areas of Americans With Disabilities Act; Complaint Investigations; Disadvantaged Business Enterprises; Equal Employment Opportunity & Diversity; EEO Contractor Compliance & On-the-Job Training; State Internal & Affirmative Action Programs; Title VI & Environmental Justice; Strategic and Performance Planning; Risk Assessment & Program/Process Reviews. In 1988, she began working in this field with the Department of Labor, in their Office of Federal Contract Compliance Program. Since 1993, she has served the FHWA in the civil rights field through assignments in the Regional Office of Civil Rights; Headquarters' Office of Civil Rights; and the Maryland Division Office. Sandra is an NHI Certified Instructor; mentor in both the Professional Development Program and Student Career Experience Program; and a member of the Society of Human Resource Management. She has served on several FHWA and State DOT national task forces and committees, and has served as Chairperson and Advisor on Recruitment and Outreach Committees. She earned a bachelor's degree in Business Administration from Morgan State University; and her master's degree in Human Resource Development from Towson University.

ENVIRONMENT TST

Stephanie Stoermer
Environmental Program Specialist
(720) 963-3218
stephanie.stoermer@fhwa.dot.gov

Stephanie Stoermer brought a wealth of expertise with her when she joined the Resource Center Environmental Technical Service Team in 2006. Stephanie first joined the FHWA in 1999 in the California Division Office. Prior to joining FHWA, she had worked for the Texas DOT and the Texas

See **STAFF** *on Page 10*

STAFF *from Page 8*

Historical Commission. She is an authority in Federal Historic Preservation laws and Native American consultation laws. Her experience includes investigating, recording and documenting cultural resources in rural and urban areas, including historic cemeteries, mines, logging camps, mills, farmsteads, transportation corridors and traces. Stephanie has considerable experience developing and delivering training in environmental regulations, policies and procedures. Additionally she is an author, having written "Prehistoric Adaptations in The Blackland Prairie" a chapter in *The Texas Blackland Prairie: Land, History, and Culture* (Baylor University Press, 1993) as well as numerous professional papers. Stephanie is the recipient of multiple honors including the FHWA Environmental Excellence Award (2005) and the Caltrans Pathfinder Award (2002). She earned both bachelor's and master's degrees in Anthropology at Baylor University. While at Baylor, she was the recipient of the Most Outstanding Anthropology Student Award.

GEOTECHNICAL & HYDRUAULIC TST

Justice Maswoswe
Geotechnical Engineer
(410) 962-2460
justice.maswoswe@fhwa.dot.gov

Justice Maswoswe has joined the Geotechnical & Hydraulic Technical Service Team. His areas of expertise include deep and shallow foundations; earth retaining structures; ground improvement; field & laboratory testing; subsurface investigations; instrumentation; slope stability; and lightweight fill materials. Prior to joining the Resource Center staff as a Geotechnical Engineer, he worked in the private sector as a Senior Project Geotechnical Engineer during conceptual/preliminary design of the multi-billion-dollar Alaskan Way Viaduct and Seawall Replacement Project in Seattle, WA; a consultant/technical advisor on deep soil-cement mixing during conceptual and final foundation design of an approximately 2-mile-long, 170-foot maximum-depth immersed tunnel for the $1 billion Busan – Geoje Fixed Link Project in Busan, South Korea; a Senior Project Geotechnical Engineer and Chief Geotechnical Engineer during design and construction of the multi-billion-dollar Central Artery/Tunnel Project in Boston, MA; and a Senior Project Geotechnical Engineer during design of the Inter-Island Tunnel Project, part of the Massachusetts Water Resources Authority's multi-billion-dollar Boston Harbor Clean-up Program. He earned his bachelor's degree in Civil Engineering, and both his master's and Ph.D. in Soil Mechanics (Geotechnical Engineering) from Imperial College, London, England.

OPERATIONS TST

Chung Tran
Incident Management & Emergency Transportation Operations Specialist
(850) 942-9650 x3041
chung.tran@fhwa.dot.gov

Chung Tran has joined the Operations Technical Service Team. Chung's areas of expertise include: Emergency Transportation Planning & Operations; Freeway System Operations; Managed Travel for Planned Events; Traffic Incident Management; Traveler Information; and Systems Engineering. His vast experience is a result of work he has done over the past 12 years for the North Dakota Department of Transportation as a Transportation Engineer, the Fargo-Moorhead Council of Governments as a Transportation Planner/Analyst, the FHWA Michigan Division, and most recently the Florida Division Office as a Transportation Planning Engineer and an ITS/Traffic Engineer, respectively. He is a member of ITE, (ITE Intelligent Traffic Signal Operations Committee) and the U.S. DOT Operations Council. During Operation Iraqi Freedom, Chung served in active duty deployment with the U.S. Army Facility Engineer Group supporting the 3rd U.S. Army in Kuwait, as the Chief of Operations for the Directorate of Public Works at Camp Arifjan with a population of more than 20,000 military service personnel. He has also served in various positions with the U.S. Army Reserve and North Dakota Army National Guard, and had numerous short deployments to Central America and Korea. Chung earned both his bachelor's and master's degrees in Civil Engineering from North Dakota State University. He is a graduate of the Army Engineer Basic and Advance Course, at the U.S. Army Engineer School; the Combined Arms Service and Staff School; and the Army Command and General Staff College.

STAFF *from Page 9*

STRUCTURES TST

Reggie Holt
Senior Structural Engineer
(410) 962-4796
reggie.holt@fhwa.dot.gov

Reggie Holt joined the Resource Center's Structures TST as a Senior Structural Engineer at the end of May. Reggie's areas of expertise include post-tensioned and pre-tensioned concrete structures; design of major and complex bridge structures; segmental bridge design and construction; accelerated bridge construction and prefabricated bridge elements; design and detailing of complex structural elements and congested regions; as well as constructability reviews and construction engineering. Reggie is a member of the American Society of Civil Engineers; the Precast/Prestressed Concrete Institute; the American Segmental Bridge Institute; and the ASCE Technical Committee – performance of structures during construction. He is also a registered Professional Engineer in Maryland, Virginia, and North Carolina. He earned both his bachelor's and master's degrees in Civil Engineering from the University of Maryland, College Park.

To the many men and women in the transportation community who have contributed to the safe travel of motorists on our Nation's highways . . .

THANK YOU!

National Engineers Week

February 18-24, 2007

--The Centered on Service Staff

CONTACT INFORMATION

Federal Highway Administration
Resource Center

Editor-in-Chief
Joyce Curtis
Resource Center Director
Phone: (410) 962-0093/Fax: (410) 962-3419
e-mail: *joyce.curtis@fhwa.dot.gov*

Contributing Editors:
Judith C. Johnson, Marketing Specialist
Phone: (404) 562-3683/Fax: (404) 562-3700
E-mail: *judith.johnson@fhwa.dot.gov*

Marie C. Roybal, Marketing Specialist
Phone: (720) 963-3241/Fax: (720) 963-3232
E-mail: *marie.roybal@fhwa.dot.gov*

Steve Moler, Public Affairs Specialist
Phone: 744-3103/Fax: (415) 744-2620
E-mail: *steve.moler@fhwa.dot.gov*

Deborah L. Vocke, Marketing Specialist
Phone: (410) 962-3744/Fax: (410) 962-3419
E-mail: *deborah.vocke@fhwa.dot.gov*

Visit our website at:
www.fhwa.dot.gov/resourcecenter

Federal Highway Administration
RESOURCE CENTER